

laser. If only such polarization switching operation is desired, the DFB laser region 120 only needs to be divided into two regions. However, since the DFB laser region 120 is divided into three regions in the second embodiment, the oscillation wavelength can also be readily controlled when amounts of currents injected into the two regions under the two electrodes 10-1 and 10-2 on the side of the antireflection layer 113 are varied, i.e., uneven current injection is performed.--

Marked-up copies of the foregoing two paragraphs showing the changes made to them are attached.

IN THE CLAIMS:

Please cancel Claims 1 through 9.

Please amend Claims 10, 19, 20, and 23 to read as follows. For the Examiner's convenience, a marked-up copy of the amended claims showing the changes made thereto is attached.

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10. (Amended) A laser comprising:
a first region with a first waveguide, said first waveguide including a first diffraction grading;
a second region with a second waveguide, said second waveguide including a second diffraction grading; and
a phase-controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide; said phase controlling region, said first region and said second region being serially coupled along a light propagation direction in this order, and being

constructed such that a coupling coefficient of said first region adjacent to said phase controlling region is smaller than a coupling coefficient of said second region, and said first and second diffraction gratings have a common value of pitch.

19. (Amended) A method for driving a laser, said method comprising the steps of:

preparing a laser including:

- a first region with a first waveguide, said first waveguide including a first diffraction grading;
- a second region with a second waveguide, said second waveguide including a second diffraction grading; and
- a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide; said phase controlling region, said first region and said second region being serially coupled along a light propagation direction in this order, and being constructed such that a coupling coefficient of said first region adjacent to said phase controlling region is smaller than a coupling coefficient of said second region, and said first and second diffraction gratings have a common value of pitch; and

changing a current injected into or a reverse voltage applied to the phase controlling region to change at least one of a polarization mode and a waveguide of light output from the laser.

20. (Amended) A light transmitter comprising:

a laser including:

a first region with a first waveguide, said first waveguide including a first diffraction grating;

a second region with a second waveguide, said second waveguide including a second diffraction grating; and

a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide; said phase controlling region, said first region and said second region being serially coupled along a light propagation direction in this order, and being constructed such that a coupling coefficient of said first region adjacent to said phase controlling region is smaller than a coupling coefficient of said second region, and said first and second diffraction gratings have a common value of pitch;

control means for controlling light output from said laser in accordance with a transmission signal; and

a mode selector for selecting a component of a desired mode from the light output from said laser.

23. (Amended) An optical communication system for communicating over a line transmission-line that transmits a signal from a transmitter side to a receiver side, said system comprising:

a light transmitter for transmitting light of a signal through the light transmission line including:

a laser including:

a first region with a first waveguide, said first waveguide including a first diffraction grating;

a second region with a second waveguide, said second waveguide including a second diffraction grating; and

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a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide; said phase controlling region, said first region and said second region being serially coupled along a light propagation direction in this order, and being constructed such that a coupling coefficient of said first region adjacent to said phase controlling region is smaller than a coupling coefficient of said second region, and said first and second diffraction gratings have a common value of pitch;

control means for controlling light output from said laser in accordance with a transmission signal; and

a mode selector for selecting a component of a desired mode from the light output from said laser; and

a receiver for receiving and detecting an intensity-modulated signal transmitted from the laser through the light transmission line.

REMARKS

This application has been reviewed in light of the Official Action dated March 28, 2001. Claims 1 through 9 have been canceled and Claims 10, 19, 20, and 23 have been amended to clarify even further the claimed subject matter. Claims 10, 19, 20,